Week beginning						
16-Jan	Chapter 1,2:	1.1 Intro to modelling with ODEs 1-5, handout	1.2 Intro to qualitative analysis: direction fields, equilibria and stability 2, 13, 16-23, 55, 56	1.3 Intro to quantitative analysis: separation of variables 11, 18, 23-32	1.4 Intro to numerical methods: Euler and R-K methods Rest to be announced	1.5 Picard's Theorem – the fundamental theorem of ODEs
23-Jan		2.1 Linear ODEs: superposition and the nonhomogeneous principle	2.2 First order linear: integrating factors and variation of parameter	2.3 Exponential growth and decay	2.4 Linear Models: mixing and cooling	2.5 Nonlinear models: qualitative analysis and separation of variables
30-Jan	Test 1					
6-Feb	Chapter 3,4:	3.1 Matrix arithmetic, transpose, trace	3.2 Algebraic linear systems: Gauss-Jordan reduction	3.3 Matrix inverse	3.4 Determinants: cofactor expansion and properties	
13-Feb		3.5 Vector spaces and subspaces: definitions and examples, function spaces	3.6 Basis and dimension: definitions, column space and invertible matrix theorem	4.1 Harmonic oscillator models	4.2 Real characteristic roots	
20-Feb		4.3 Complex characteristic roots				
27-Feb	Test 2					
6-Mar		4.4 Nonhomogeneous equations: method of undetermined coefficients	4.5 Nonhomogeneous equations: variation of parameter	4.6 Forced oscillator model		
13-Mar	Chapter 5:	5.1 Linear transformations: definition, examples, differential operators on function spaces	5.2 Properties of linear transformations: kernel and rank theorems, nonhomogeneous principle	5.3 Eigenvalues and eigenvectors		
20-Mar	Spring Break					
27-Mar						
3-Apr	Test 3					
10-Apr	Chapter 6,7:	6.1 Intro to linear systems of ODEs: superposition and nonhomogeneous principle, converting higher order linear equations to linear systems	6.2 Coefficient matrices with real eigenvalues, distinct and repeated: solutions and phase plane	6.3 Coefficient matrices with nonreal eigenvalues: real-valued solution space as a subspace of complex-valued solution space	6.4 Stability and classification of equilibria of linear systems of ODEs	
17-Apr		7.1 Nonlinear systems of ODEs: equilibria and phase portraits	7.2 Linearization at an equilibrium			
24-Apr						
1-May	Test 4					
8-May	Finals					